

CLAIMS

What is claimed is:

1. A method for operating a repeater in a wireless local area network (WLAN) having one or more repeaters and a network protocol for communicating between one or more base units and one or more client units, the one or more base units and one or more client units receiving and transmitting on at least a first frequency channel, the network protocol defining multiple operating frequencies, the method comprising:
 - monitoring the multiple operating frequencies to detect a signal transmitted by one of the one or more base units on the first frequency channel;
 - characterizing the signal to determine whether the signal is associated with the one of the one or more base units; and
 - selecting a second frequency channel for use by at least one of the one or more repeaters for retransmission of one or more additional signals received on the first frequency channel based on the characterizing of the signal.
2. The method according to claim 1, wherein the monitoring includes tuning a detector circuit to one or more of the multiple operating frequencies to detect the signal on the first frequency channel.
3. The method according to claim 1, wherein the characterizing includes determining whether one or more base unit characteristics are associated with the signal including: a power level, a known sequence of modulated symbols, a nearly periodic transmission, a level of activity, a minimum packet duration, and a maximum packet duration.

4. The method according to claim 1, wherein the selecting the second frequency channel includes applying at least one frequency selection rule based on the characterization for selecting the second frequency channel.
5. The method according to claim 4, wherein the at least one frequency selection rule further includes selecting the second frequency channel a predetermined number of channels away from the first frequency channel.
6. The method according to claim 1, wherein the selecting the second frequency channel includes automatically selecting the second frequency channel based on the frequency of the first frequency channel.
7. The method according to claim 1, wherein the selecting the second frequency channel includes selecting the second frequency channel so as to minimize interference between the repeater and the one or more base units, one or more client units, and the one or more repeaters.
8. The method according to claim 1, wherein the selecting the second frequency channel includes monitoring the second frequency channel for a first level of activity indicating the second frequency channel is already in use.
9. The method according to claim 1, wherein the selecting the second frequency channel includes determining whether the second frequency channel has already been selected for use as a repeater channel by another one of the one or more repeaters.

10. The method according to claim 8, further comprising establishing the second frequency channel as a valid channel for use if the first level of activity monitored is at or below a minimum level.
11. The method according to claim 8, wherein the selecting the second frequency channel further includes disqualifying the second frequency channel for selection as a valid repeater channel if one or more signals are detected on the second frequency channel having characteristics associated with a base unit.
12. The method according to claim 11, wherein the selecting the second frequency channel further includes pre-selecting a third frequency channel if the second frequency channel is disqualified as a valid repeater channel.
13. The method according to claim 12, further comprising providing an indication if no valid repeater channel is available.
14. The method according to claim 13, further comprising providing an indication if no valid repeater channel is available that the repeater should be moved to a different physical location.
15. The method according to claim 8, wherein the selecting the second frequency channel further includes monitoring the second frequency channel for the first level of activity and monitoring the first frequency channel for a second level of activity and comparing the first level of activity and the second level of activity to determine if transmissions on a pre-selected repeater channel is a transmission from another one of

the one or more repeaters using the first frequency channel and the second frequency channel and disqualifying the second frequency channel as a valid repeater channel if the transmission are determined to be transmissions from the another one.

16. The method according to claim 1, wherein the selecting the second frequency channel further includes sending a test transmission on the second frequency channel, and monitoring the first frequency channel, to detect the presence of another one of the one or more repeaters operating on the second frequency channel being tested.

17. The method according to claim 16, wherein the test transmission includes one or more of: a frequency hopped signal, a spread spectrum signal, a band limited noise signal, a modulated waveform, and a broad band noise signal.

18. The method according to claim 16, further comprising reducing a transmit power of at least one of the one or more repeaters until a feedback loop is broken if the another one is determined to be operating on the second frequency channel being tested.

19. The method according to claim 18 further comprising providing an indication that the transmit power is being reduced.

20. The method according to claim 19, wherein the providing an indication includes providing an indication on an LED.

21. A method for operating a repeater in a wireless local area network (WLAN) having one or more repeaters, a network protocol for communicating between one or more base units and one or more client units, the one or more base units and one or more client units receiving and transmitting on at least a first frequency channel, the network protocol defining multiple operating frequencies valid for operation in the WLAN, the method comprising:

detecting one or more signals on one or more of the multiple operating frequencies;

identifying a wireless transmission on a first one of the multiple operating frequencies;

pre-selecting a second channel for use by the repeater based on at least one rule;

monitoring the second frequency channel for the presence of the one or more signals indicating the wireless transmission; and

setting the repeater to operate on the first frequency channel and the second frequency channel if a number of the one or more signals is at or below a minimum value.

22. The method according to claim 21, further comprising sending a test transmission on the second frequency channel, and monitoring the first frequency channel to detect the presence of another one of the one or more repeaters operating on the second frequency channel being tested.

23. The method according to claim 22, further including providing an indication if no presence is detected for the repeater to be moved to a different physical location.

24. A method for operating a repeater in a wireless local area network (WLAN) having one or more repeaters, a network protocol for communicating between one or more base units and one or more client units, the one or more base units and one or more client units receiving and transmitting on at least a first frequency channel, the network protocol defining multiple operating frequencies valid for operation in the WLAN, the method comprising:

- detecting one or more signals on one or more of the multiple operating frequencies indicating the presence of one or more wireless transmissions on at least a first frequency channel of the multiple operating frequencies;

- pre-selecting a second frequency channel for use by the repeater;

- detecting the one or more signals on the second frequency channel indicating the presence of the one or more wireless transmissions on the second channel;

- setting the repeater to operate on the first frequency channel and the second frequency channel a number of the one or more signals is at or below a minimum value;

- transmitting a test signal on the second frequency channel and monitoring the first frequency channel; and

qualifying the second frequency channel as a valid channel for operation of the repeater if no other of the one or more repeaters is operating on the first frequency channel and the second frequency channel, otherwise if an other repeater is operating the first frequency channel and the second frequency channel, reducing a power level associated with the test signal to determine a transmission level preventing a feedback loop with the other repeater, and setting the repeater to transmit at the determined level.

25. In a wireless network having one or more repeaters, a network protocol for communicating between one or more base units and one or more client units, the one or more base units and one or more client units receiving and transmitting on at least a first frequency channel of at least two frequency channels, the network protocol defining multiple operating frequencies, an apparatus for enhancing coverage of the wireless network comprising:

a frequency translating repeater configured to:

monitor the multiple operating frequencies to detecting a signal transmitted by one of the one or more base units on the first frequency channel;

characterize the signal to determine whether the signal is associated with the one of the one or more base units; and

select a second frequency channel for use by the frequency translating repeater for retransmission of one or more additional signals received on the first frequency channel based on the characterizing of the signal.

26. The apparatus according to claim 25, wherein the frequency translating repeater is further configured to provide an indication if no frequency channels are available for the selecting.

27. The apparatus according to claim 26, wherein the indication includes indicating that the frequency translating repeater should be moved to a different physical location.

28. The apparatus according to claim 25, wherein the frequency translating repeater is further configured exclusively as a physical layer repeater.

29. The apparatus according to claim 25, wherein the frequency translating repeater is further configured exclusively as an RF signal repeater.

30. In a wireless network including one or more base units and one or more client units, the one or more base units capable of transmitting on a first one of the at least two frequency channels and the one or more client units capable of transmitting on a second one of the at least two frequency channels, the wireless network having multiple operating frequencies, an apparatus for enhancing coverage of the wireless network comprising:

a frequency translating repeater configured to:

detect one or more signals on one or more of the multiple operating frequencies;

identify a wireless transmission on a first one of the multiple operating frequencies;

pre-select a second channel for use by the frequency translating repeater based on at least one rule;

monitor the second frequency channel for the presence of the one or more signals indicating the wireless transmission; and

set the frequency translating repeater to operate on the first frequency channel and the second frequency channel if a number of the one or more signals is at or below a minimum value.

31. The apparatus according to claim 30, wherein the frequency translating repeater is further configured to provide an indication if no frequency channels are available for the setting.

32. The apparatus according to claim 31, wherein the indication includes indicating that the frequency translating repeater should be moved to a different physical location.

33. The apparatus according to claim 30, wherein the frequency translating repeater is further configured exclusively as a physical layer repeater.

34. The apparatus according to claim 30, wherein the frequency translating repeater is further configured exclusively as an RF signal repeater.